

REMARKS

This application has been carefully considered in connection with the Examiner's Office Action dated July 6, 2007. Reconsideration and allowance are respectfully requested in view of the following.

Summary of Rejections

Claims 1-4, 7, 11-34 and 36-41 were pending at the time of the Office Action.

Claims 1-4, 7, 11-34 and 36-41 were rejected under 35 USC § 103(a) as being unpatentable over Suaez (U.S. Patent No. 5,790,789) in view of Hejlsberg et al. (U.S. Patent No. 7,165,239).

Summary of Response

Claims 1, 4, 11, 14, 21, 22, 24, 37, 38, and 40 are currently amended.

Claims 2, 3, 7, 12, 13, 17, 23, 27, 31-34, 36, 39, and 41 were previously presented.

Claims 5-6, 8-10, and 35 were previously canceled.

Claims 15-16, 18-20, 25-26, and 28-30 remain as originally filed.

Remarks and Arguments are provided below.

Summary of Claims Pending

Claims 1-4, 7, 11-34, and 36-41 are currently pending following this response.

Applicant Initiated Interview

Applicant thanks Examiner John Winter and SPE Andrew Fischer for their time and consideration of the arguments presented in the telephone interview on August 28, 2007. In the interview, an overview of the claimed subject matter was presented along with explanations of the claimed enterprise object model, what was intended by claiming front-office and back-office systems that interact through the enterprise integration layer, the role of the messaging system, and the differentiation of each of an interaction, an event, and a message. No agreement was reached in the interview. SPE Andrew Fischer and Examiner John Winter suggested more positively reciting the claim limitations. Applicant has amended the claims based on the suggestions provided by SPE Andrew Fischer and Examiner John Winter. A detailed discussion of the amendments and each of the issues mentioned above follows.

Response to Rejection

The pending disclosure is directed to an enterprise integration layer that integrates front-office and back-office systems for data and services. That is, back-office systems provide data and services and the front-office systems use the enterprise integration layer to access the data and services provided by the back-office systems. Paragraphs 0057 and 0058 of the pending application describe two use-case examples of the implementation of the enterprise integration layer for providing data access and service invocation, respectively.

The enterprise integration layer may include an enterprise object model that defines objects that represent the data and services provided by the back-office systems as described in paragraphs 0043 and 0044. For example, the enterprise object model may be defined through the use of a Unified Modeling Language (UML) graphical editor.

Front-office applications may access the objects in the enterprise object model through standardized client access interfaces that enable standardized access to back-office data and services through a plurality of different technologies as disclosed in paragraph 0040 and 0051. By providing access to objects that model the back-office data and services, the client access interfaces eliminate the tight coupling between the front-office systems and the back-office systems. Further, the modular architecture provided by the enterprise object model allows rapid changes to support new requirements.

Upon an object in the enterprise object model being accessed through the client access interfaces, a business object server may implement any data functions and service methods associated with the accessed object. The business object server may implement the data functions and service methods by performing object assembly, object disassembly, and service invocation functions, as described in paragraphs 0048-0050.

A set of adaptors may be used to map between the data services modeled in the enterprise object model and the data and functions of the back-office systems as described in paragraphs 0044-0046. The enterprise integration layer also includes a

rules engine that defines and stores rules regarding criteria for when to publish the business events and rules regarding transforming data from a common format, such as the format of the enterprise object model, to a format of the back-office systems as disclosed in paragraph 0045.

The enterprise integration layer further includes a business event repository that contains definitions of the business events that are of interest to a plurality of the computing applications and also identifies all of the publishers for each of the business events as disclosed in paragraph 0046. Paragraph 0041 discloses that events are a key milestone within a process flow. Paragraph 0050 discloses that upon the occurrence of an event, if the business event repository indicates that components elsewhere in the enterprise need to be aware of the event, then the event is published to a message broker.

Paragraphs 0062-0065 disclose that the message broker is a middleware layer that can connect disparate applications and transport information in a consistent format between systems. Events may be published to a message bus or a message queue on the message broker in a standard format to minimize or eliminate data replication. Also, the message broker may include connectors and adapters for integrating applications with the messaging environment. A source application may publish an event to the message broker through a source application adapter. The source application adaptor transforms data of the business event from a format of the source application to a standard data format. A target application adaptor may subscribe to events desired by a target application, transform data of the event from the standard

format to a format of the target application so that the target application can retrieve a message. The middleware architecture of the message broker can eliminate the need for tight integration between application programming interfaces and therefore provide a more flexible environment.

The claims have been amended herein to further clarify these and other aspects of the pending application.

Response to Rejections Under 35 U.S.C. 103

In the Office Action dated July 6, 2007, Claims 1-4, 7, 11-34 and 36-41 were rejected under 35 USC § 103(a) as being unpatentable over Suarez (U.S. Patent No. 5,790,789, hereinafter "Suarez") in view of Hejlsberg et al (U.S. Patent No. 7,165,239, hereinafter "Hejlsberg").

Claim 1:

I. Suarez in view of Hejlsberg does not teach or suggest an enterprise integration layer.

Amended Claim 1 requires that the enterprise integration layer "integrates a **plurality** of front-office systems with a **plurality** of back-office systems" (emphasis added). Claim 1 further requires that "the back-office systems **provide** data and services and the front-office systems **use** the enterprise integration layer to access the data and services provided by the back-office systems" (emphasis added).

The Office Action relied on Fig. 11 of Suarez to teach these limitations. Fig. 11 of Suarez simply illustrates the process of communication between two services.

Column 26, lines 40-42 of Suarez discloses, "In Fig. 11, a **computer host** is shown containing a Bus Agent 140, two agents 141, 142 and their corresponding services 143,144" (emphasis added). Therefore it is clear that the disclosure in Fig. 11 of Suarez is directed to communication between two services within a single computer host. There is no teaching or suggestion in Fig. 11 of an enterprise integration layer that integrates a plurality of front-office systems with a plurality of back-office systems, as required by the claims.

A more relevant section of Suarez is the discussion of the computer architecture of Suarez corresponding with Fig. 1 and Fig. 6. Fig. 6 provides a more detailed representation of the architecture disclosed by Suarez. As shown, Fig. 6 includes a plurality of users 13, a plurality of host computers 60, a plurality of configuration databases 64, directory services 67, repositories 66, and a communication network 59. The host computers 60 may be segregated into various domains 62. Each of the host computers 60 may support one or more services 72. Each of the services 72 may be accessed through or communicate through an agent 70. An agent 72 provides interconnectivity and services on behalf of a user or another agent.

Suarez discloses in Column 8, lines 58-65 that the communication network 59 supports communication between the computer hosts 60. Further, Column 9, lines 28-30 discloses that agents facilitate cooperation and collaboration between agents on different hosts. Still further, Column 15, line 66 - Column 16, line 1 discloses that each service comprises as a minimum, the capacity to send and receive messages.

Looking back to the claim limitations of Claim 1, the plurality of back-office systems are recited to provide data and services. Therefore, the plurality of host computers 60 of Suarez may broadly be interpreted as the claimed "plurality of back-office systems". However, Suarez does not disclose a plurality of "front-office systems". In particular, Claim 1 has been amended to require that the claimed "front-office systems" use the enterprise integration layer to access the data and services provided by the back-office systems. As noted above, each of the host computers 60 of Suarez may directly communicate with another of the host computers 60 through agents on the host computers 60 and through the communication network 59. Therefore, there is no structure in Suarez that integrates a plurality of the host computers 60 with another plurality of host computers 60 such that the plurality of host computers 60 can access the data and services provided by the other plurality of host computers 60.

Assuming *arguendo* that a subsequent Office Action will attempt to interpret the communication network 59 of Suarez as the claimed enterprise integration layer, Applicant notes that communication network 59 does not comprise all of the limitations of the claimed enterprise object model, the set of client access interfaces, the business object server, or the set of adaptors as recited in the limitations of a1-a4.

Further, assuming *arguendo* that a subsequent Office Action will attempt to interpret the agents of Suarez as the claimed enterprise integration layer, Applicant notes that the agents are software processes that are executed on the host computers 60. Therefore, the agents do not provide any structure to integrate a plurality of host computers 60 with another plurality of host computers 60. Also, the software agents

only enable communication between one of the host computers 60 and another of the host computers 60. Further, the agents of Suarez do not comprise all of the limitations of the claimed enterprise object model, the set of client access interfaces, the business object server, or the set of adaptors as recited in the limitations of a1-a4.

II. Suarez in view of Hejlsberg does not teach or suggest publishing business events in accordance with the interactions between the front-end systems and the back-end systems.

Suarez discloses an event service in Column 21, lines 35-51. Suarez discloses an example where a marketing department may submit a request to the appropriate agent and service to be informed when a project has moved into the beta-testing phase. Upon the project changing to beta-testing, an e-mail may be sent to the marketing department that originated the request. Applicant notes that the event in this example (i.e., the project changing to beta-testing) is not published (i.e., e-mailed) in accordance with interactions between the host computers 60. Rather, the event is published based on a project associated with a service and an agent meeting a defined condition.

III. Suarez in view of Hejlsberg does not teach or suggest an enterprise object model.

The Office Action relied on the disclosure in Fig. 11 to read on the limitations of the Claimed "enterprise object model". As noted above, Fig. 11 merely illustrates the process of communication between two services within a host computer. Fig. 11 and the corresponding description do not teach or suggest an enterprise object model. As

recited in Claim 1, the enterprise object model defines objects that model the data and services provided by the back-office systems.

Suarez similarly discloses to maintain registration information of objects within the distributed computing environment as disclosed in Column 12, lines 35-64. As the term is used in the disclosure of Suarez, an object is a component within the distributed computing environment such as an agent or a service (Column 15, lines 36-49). Column 13, lines 39-67 of Suarez discloses the registration process for registering an object within a Configuration Database 64 or a Repository 66. Suarez discloses in Column 14, lines 20-56 that every object that is registered is identified with an object identifier (OID) or an alias. Suarez discloses in Column 14, line 67 - Column 15, line 2 that the OID provides a means to identify and locate an object within the distributed computing environment.

In contrast, an object of the enterprise object model **models** data or services provided by the back-office systems. For example, as disclosed in paragraph 0044, an object may be mapped to/from data and services. Further, paragraph 0049 discloses that a single object may be used to aggregate data from multiple back-office systems. Similarly, a single object may be broken up for storage in multiple back-office systems. Paragraph 0050 discloses that a single method call of an object may be translated into multiple service invocations in back-office systems.

The objects of Suarez do not model data and services and are not translated or mapped to the data and services of the back-office systems. Rather, the objects of Suarez are the data and services or identify the data and services of the host

computers. Therefore, Suarez does not disclose an enterprise object model with objects that model the data and services provided by the back-office system.

IV. Suarez in view of Hejlsberg does not teach or suggest a set of client access interfaces.

The Office Action relied on the disclosure of agents to read on the claimed set of client access interfaces. As noted above, Suarez does not teach or suggest front-office systems or an enterprise object model. For at least those reasons Suarez does not teach an interface through which the front-office systems access the objects of the enterprise object model. Further, the claims have been amended to clarify that each of the client access interfaces correspond with a different technology and provide a standardized interface. Applicant notes that the agents of Suarez are not taught or suggested to correspond with different technologies.

As disclosed in paragraph 0051 of the pending disclosure, the client access interfaces can include an object interface 342, a relational interface 344, and a web services interface 346. The object interface enables technologies such as JAVA, C, and C++ programs to access objects. The relational interface 344 enables technologies such as SQL ODBC, or JDBC to access objects. The web services interface 346 enables technologies such as HTTP and SOAP to access objects.

V. Suarez in view of Hejlsberg does not teach or suggest a business object server.

The Office Action relied on the description of the communication between two services illustrated in Fig. 5. While the process illustrated in Fig. 5 does generally disclose an interaction between two services, the process does not teach or suggest

enabling interactions between front-office systems and back-office systems as claimed. Further, the process illustrated in Fig. 5 does not teach or suggest implementing data functions and service methods associated with the accessed objects. As discussed in detail above, a service is an object according to the disclosure of Suarez. If a user 13 wants to use a service, they simply access the service directly through the appropriate agent. Therefore, there is no teaching or suggestion of implementing any other data functions or service methods associated with an object prior to accessing the data and services of the back-office systems.

VI. Suarez in view of Hejlsberg does not teach or suggest a set of adapters.

The Office Action indicated that Suarez does not explicitly disclose the claimed set of adapters. The Office Action relied on the disclosure of Hejlsberg to cure the deficiency of Suarez. Hejlsberg discloses a programming framework 132 that permits multi-language development and seamless integration by supporting multiple languages (Hejlsberg: Column 4, lines 37-45). Hejlsberg discloses that a common language specification (CLS) 140 may be used to integrate code modules written in different programming languages. The CLS 140 specifies a subset of features or rules about features that allow the various languages to communicate. Since different languages are well suited to particular tasks, the seamless integration provided by the CLS 140 allows a developer to use code modules written in different languages (Hejlsberg: Column 5, lines 25-49). Applicant respectfully submit that while the CLS 140 enables integration of various computer languages, the CLS 140 does not perform any transformations.

The Office Action relied on the disclosure of Hejlsberg in Column 5, line 60 - Column 6, line 44). The cited section of Hejlsberg discloses that the programming framework 132 encapsulates the operating system 146(1) and object model services 146(2). The object model services 146(2) provide interfacing with other objects to perform various tasks. Calls made to an API layer 142 are handed to the operating system 146(1) or the object model services 146(2) for execution. Hejlsberg discloses that the API layer 142 may be grouped into multiple namespaces. The cited section of Hejlsberg does not provide any teaching or suggestion of transforming objects of the enterprise object model into a format of the back-office systems that correspond with the implementation of the data functions and service methods implemented by the business object server.

VII. There is no motivation to combine Suarez and Hejlsberg.

The Office Action stated that it would have been obvious to combine Suarez and Hejlsberg "in order to allow distributed processes to be deployed over non-homogenous networks." Applicant respectfully submits that it is unclear how the teachings of Suarez and Hejlsberg are being combined. How would the CLS 140 and the API layer 142 of Hejlsberg be combined and used with the agents of Suarez? It appears that the agents of Suarez already perform a similar function as the CLS 140 and the API layer 142 of Hejlsberg and the combination may result in destroying the teachings of the Suarez reference. Further, there is no disclosure in either Suarez or Hejlsberg that suggests the motivation used in the Office Action to combine the references. Namely, neither Suarez nor Hejlsberg disclose to "allow distributed processes to be deployed over non-

homogenous networks." Still further, the Office Action did not provide any rationale or discussion of why the knowledge of one skilled in the art would suggest this motivation. Also, the Office Action did not provide any discussion of any design needs or market pressures to solve a problem through a finite number of identified, predictable solutions where a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.

For at least the reasons established above in sections I-VII, Applicant respectfully submits that independent Claim 1 is not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of this claim.

Dependent Claims 2-4, 7, and 37-41 depend directly or indirectly from independent Claim 1 and incorporate all of the limitations thereof. Accordingly, for at least the reasons established in sections I-VII above, Applicant respectfully submits that Claims 2-4, 7, and 37-41 are not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of these claims.

Dependent Claim 37:

VIII. Suarez in view of Hejlsberg in view of Official Notice does not teach or suggest any of object assembly, object disassembly, and service invocation functions.

Applicant respectfully traverses the Official Notice taken in conjunction with the rejection of Claim 37. Applicant respectfully requests a showing of the facts taken regarding object assembly and object disassembly are well known in the prior art. Further, Applicant respectfully submits that it is unclear how the facts taken in conjunction with the Official Notice are being combined with the teachings of the Suarez

and Hejlsberg references. Also, Applicant respectfully submits that there is no motivation to combine the teachings of the Official Notice with Suarez and Hejlsberg. As discussed above, Suarez does not disclose that the objects model data, but rather are the data (or service). Therefore, it is unclear as to why one skilled in the art would be motivated to more accurately model the data being represented, when the objects of Suarez fully represent the data already. The claimed object assembly and object disassembly functions are used such that an object in the enterprise object model may include composite objects that represent data from multiple back-office systems. It is unclear how using the claimed object assembly and object disassembly functions more accurately model the data being represented.

Assuming *arguendo* that the facts taken in the Official Notice were known in the prior art, Suarez in view of Hejlsberg in view of the Official Notice still would not disclose an enterprise integration layer (or other middleware layer) with an business object server that performs the object assembly and object disassemble functions. When the object assembly and object disassembly functions of the business object server are used in the enterprise integration layer in conjunction with the enterprise object model as described above and claimed, the tight coupling between the front-office systems and the back-office systems may be eliminated.

Claim 11:

Claim 11 includes limitations substantially similar to the limitations discussed in sections I, II, and IV-VII above. For at least the reasons established above in sections

I, II, and IV-VII, Applicant respectfully submits that independent Claim 11 is not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of this claim.

Dependent Claims 12-20 depend directly or indirectly from independent Claim 11 and incorporate all of the limitations thereof. Accordingly, for at least the reasons established in sections I, II, and IV-VII above, Applicant respectfully submits that Claims 12-20 are not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of these claims.

Claim 21:

Claim 21 includes limitations substantially similar to the limitations discussed in sections I, II, and IV-VII above. For at least the reasons established above in sections I, II, and IV-VII, Applicant respectfully submits that independent Claim 21 is not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of this claim.

Dependent Claims 22-30 depend directly or indirectly from independent Claim 21 and incorporate all of the limitations thereof. Accordingly, for at least the reasons established in sections I, II, and IV-VII above, Applicant respectfully submits that Claims 22-30 are not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of these claims.

Claim 31:

Claim 31 was rejected in parallel with Claim 1 for at least the same reasons. Applicant notes that the limitations of Claim 31 are not parallel with Claim 1. Rather, the limitations of Claim 31 parallel the limitations of Claim 41.

IX. Suarez in view of Hejlsberg does not teach or suggest transforming data.

Claim 31 requires transforming data related to the one of the business events from a format of the source application to the common format and transforming the data related to the one of the business events from the common format to a format of the target application. As argued previously in prosecution, there is no teaching or suggestion of transforming data in Suarez. Rather, in Suarez all data is exchanged through messaging where the messages have a well-defined format. Due to the well-defined nature of the communication, there is no disclosure of or necessity to transform data for enabling the communication. Suarez provides a detailed discussion of the process for communicating between services in Column 11, lines 15-43. While Suarez does disclose that the **content** of a message may be modified, Suarez does not provide any teaching or suggestion of transformation of data **formats** in this discussion.

Further, while Suarez does disclose an event service in Column 21, lines 35-51, Suarez does not provide any teaching or suggestion of transforming the format of the message from a format of a source application to a common format and from the common format to a format of a target application, as required by Claim 31. Applicant respectfully submits that the disclosure of the CLS 140 and the API layer 142 of Hejlsberg does not cure the deficiencies of Suarez. In particular, Hejlsberg does not

provide any teaching or suggestion of transforming data related to a business event upon the occurrence of the business event.

As discussed in detail above, the middleware architecture of the message broker can eliminate the need for tight integration between application programming interfaces and therefore provide a more flexible environment.

For at least the reasons established above in section IX, Applicant respectfully submits that independent Claim 31 is not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of this claim.

Dependent Claims 32-34 and 36 depend directly or indirectly from independent Claim 31 and incorporate all of the limitations thereof. Accordingly, for at least the reasons established in section IX above, Applicant respectfully submits that Claims 32-34 and 36 are not taught or suggested by Suarez in view of Hejlsberg and respectfully request allowance of these claims.

Conclusion

Applicant respectfully submits that the present application is in condition for allowance for the reasons stated above. If the Examiner has any questions or comments or otherwise feels it would be helpful in expediting the application, he is encouraged to telephone the undersigned at (972) 731-2288.

The Commissioner is hereby authorized to charge payment of any further fees associated with any of the foregoing papers submitted herewith, or to credit any overpayment thereof, to Deposit Account No. 21-0765, Sprint.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael W. Piper", is written over a horizontal line.

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